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**United States  
Department of  
Agriculture**

Rural  
Electrification  
Administration

REA  
Bulletins  
86-4 (Electric)  
387-4 (Telephone)

September 1981

# Presentation of Building Plans and Specifications

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U.S. DEPT. OF AGRICULTURE  
RURAL ELECTRIFICATION ADMINISTRATION

## SI Conversion Units

Most measurement units in this bulletin provide guidance regarding Public Law 90-480 (42 U.S.C. 4151) which references American National Standards Institute (ANSI) Standard A117.1-1961 (R1971), "Specifications for Making Buildings and Facilities Accessible to, and Usable by, the Physically Handicapped." This ANSI Standard uses common U.S. units of measurement and common units have been used in this bulletin. However, in recognition of the position of the United States as a signatory to the General Conference on Weights and Measures, which gave official status to the SI system of units, conversion factors applicable to the U.S., units used in this bulletin are presented below:

### Length

1 in. = 0.0254 meter(m)  
1 ft. = 0.3048 meter(m)

### Illuminance

1 footcandle = 10.76 lux (lx)

### Temperature

degree Celsius ( $t^{\circ}\text{C}$ ) = {degree Fahrenheit( $t^{\circ}\text{F}$ )-32}  $\div$  1.8

## TABLE OF CONTENTS

	<u>Page</u>
I. Purpose . . . . .	1
II. General . . . . .	1
III. Energy Conservation Design . . . . .	1
IV. Specifications . . . . .	7
V. Public Laws . . . . .	8
VI. Telephone Central Office Buildings . . . . .	13
VII. Headquarters Facilities (Office, Garage, Warehouse, Storage, Etc.) . . . . .	15
VIII. All Buildings . . . . .	15
IX. Drawings . . . . .	16



UNITED STATES DEPARTMENT OF AGRICULTURE  
Rural Electrification Administration

September 10, 1981\*  
Supersedes 2/28/79

REA BULLETIN 86-4:387-4

SUBJECT: Presentation of Building Plans and Specifications

I. Purpose: To set forth guidelines for expediting the review and approval of building plans and specifications by REA.

II. General:

- A. In reviewing the plans and specifications for proposed buildings, REA finds a number of items consistently omitted or not clearly presented; consequently, approvals of plans and specifications are often needlessly delayed. Review and approval can be expedited by clearly incorporating applicable guidelines, presented here, in the final contract documents.
- B. Most of the guidelines presented in this bulletin represent standard and sound building practices and are offered as suggestions for the architect's consideration. Some explanatory information is presented to assist borrowers in complying with the provisions of the public laws and REA Bulletin 86-3, "Headquarters Facilities for Electric Borrowers," and 320-5, "Headquarters Facilities for Telephone Borrowers." Other guidelines draw attention to the contract form, liquidated damages, etc., (REA Bulletin 86-2, "Preconstruction Activities for Headquarters Facilities for Electric Borrowers," and 387-1, "Preparation of Plans and Specifications for Construction of Telephone Borrowers' Buildings").

III. Energy Conservation Design:

- A. No new building should be planned without giving careful consideration to the potential application of solar energy. Because of fuel costs, the use of a structure as a solar collector and heat trap should become a design consideration. Structure siting, orientation, insulation and thermal mass should all be considered by the designer. The building should be designed to function as a passive solar collector; if practical, it should be a high thermal mass heat trap; it should be oriented and sited for installation of an active solar energy system whether or not an active system is initially installed.

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\*Revised to update information regarding public laws, and to expand conservation information to include guidelines regarding load management plans, landscaping and air infiltration.



Evaluations of active thermal solar options (space heating and cooling, and water heating) should be based on long-term economic considerations including anticipated increases in fuel costs. The opportunity to play a role in demonstrating solar energy applications within the community should also be considered. Borrowers which are planning new or extensively remodeled headquarters facilities have a unique opportunity in this regard. REA believes that if full and careful consideration is given, a significant percentage of new structures could include active thermal solar systems for water heating, and in some cases, for space heating or cooling. Borrowers are cautioned, however, to utilize the services of an architectural-engineering firm having knowledge and capability in energy conservation and passive solar architectural considerations and, as appropriate, in the area of active solar energy systems. Because of the investment needed for an active solar system, there is no room for mistakes. The system including all components (collector, heat transfer medium, pumps, piping, controls, gasketing, etc.,) should be of proven performance. The equipment, as well as the necessary system design and installation technology, should be commercially available. It is necessary to verify that the consultant has the knowledge, experience, and capability to provide an effective long-lasting, low maintenance reliable system.

- B. REA strongly recommends that normally heated or air conditioned areas such as offices, lobbies, meeting rooms, etc., be provided with the following minimum values of thermal insulation.

Winter Degree Days	Recommended Minimum Insulation								Glazing
	Ceilings		Walls		Floors		Slab	Edge	
	U	R	U	R	U	R	U	R	
2500 or less	.038	26	.077	13	.09	11	None	None	Single
2501 to 4500	.03	33	.05	19	.077	13	.20	5	Double
4501 to 6000	.03	33	.05	19	.05	19	.13	7.5	Double
6001 to 8000	.026	38	.05	19	.05	19	.13	7.5	Double
8001 or more	.026	38	.05	19	.05	19	.10	10.0	Triple



Compliance with the above insulation provisions should be required by and shown on the plans and specifications. The "U" values may be obtained with any acceptable material(s) and/or structural system; reliance on air space in walls is not recommended. In buildings where mass will significantly increase building energy efficiency, REA has no objection to nominal reductions in these insulation recommendations.

- C. Heating, ventilation and air conditioning (HVAC) systems should be designed for efficient operation for the type of expected use. The hours of operation at full load and at various part loads (operation of systems and components) should not be ignored in studies and projects of building energy use. Where appropriate, an economy cycle should be considered so that outside air can be appropriately introduced into the system to provide cooling to the extent possible. Also, consideration should be given to the possibility of reclaiming excess heat from one part of a building for use in providing heat in other parts of the building. Decisions regarding the type of system, economy cycle, heat reclaim system, etc., should be based on long-range economic evaluations rather than simple first-cost comparisons.
- D. Where efficiency indices such as coefficient of performance (COP) or energy efficiency ratio (EER) are applicable to the heating or air conditioning equipment to be obtained, the minimum acceptable indices at standard rating conditions should be stated in the specifications. Following are various recommended minimum indices. Depending on competitive conditions, especially as more energy efficient equipment becomes available, it will probably be economically advantageous to specify more efficient equipment than indicated below. The architect should also consider requiring more efficient equipment in cases where the architect is aware of adequate competition in supplying such equipment. Heat pumps presently becoming available have cooling EER's ranging from 9.5 to 10.0 and heating COP's from 3.4 to 4.0. The availability of high efficiency equipment should be investigated and, if practical, specified.

Recommended Minimum COP for Heat Pumps (Heating Mode)	
Source and Outdoor Temperature	COP
Air Source - 47°F db/43°F wb	2.5
Air Source - 17°F db/15°F wb	1.5
Water Source - 60°F Entering	2.5
db-dry bulb	wb-wet bulb

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 Recommended Minimum EER (Cooling) for Electric HVAC System Equipment
 

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Item	EER
Air Entering Equipment - 80°F db/67°F wb	
Condenser Ambient (air cooled) - 95°F db/75°F wb	7.5
Condenser Water (water cooled) - 85°F Inlet/95°F Outlet	7.5
db-dry bulb                      wb-wet bulb	

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 Recommended Minimum COP\* For  
 HVAC System Heat Operated Cooling Equipment
 

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Heat Source	COP
Indirect-Fired (Steamy Hot Water)	0.68
Direct-Fired (Gas, Oil)	0.48

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 Recommended Minimum COP\* for Electrically Driven  
 HVAC System Components (Cooling)
 

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Component	Condensing Means	COP		
		Air	Water	Evaporator
Self-contained	Centrifugal	2.3	4.0	
Water Chillers	Positive Displacement	2.2	3.4	
Condenserless	Positive Displacement	2.8	3.4	
Water Chillers				
Compressor and	Positive Displacement	2.5	3.5	3.5
Condenser Units				

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\*At Standard Rating Conditions per American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) Standard No. 90A-80, "Energy Conversion in New Building Design."

- E. REA recommends that borrowers and their architects give consideration to the use of natural light and energy-efficient artificial lighting systems in the design of headquarters facilities. Significant energy savings are also possible by relamping existing installation with more efficient sources of illumination.

1. Natural Lighting Systems: The amount of daylight that can be effectively introduced into a building is related to the design and orientation of the facility. Because of this, a borrower and architect should study a proposed project to determine whether a natural lighting system, supplemented by artificial illumination, is a cost-effective alternative. In making this determination, all possible costs and benefits associated with a natural lighting system should be evaluated.



2. Artificial Lighting Systems: Presently, there are several artificial lighting systems in common use ranging from the most efficient, high pressure sodium, to the least efficient, the incandescent. The following table outlines the relative efficiencies of the various systems. This data should not serve as the sole basis for the selection of a particular lighting system since other factors such as task performance, visual characteristics and total cost may influence system selection. However, this information should provide some general guidance in the development of a lighting scheme for new headquarters or the relamping of existing ones.

Efficiencies of Artificial Light Sources

Type of Artificial Lighting System	(Lumens/Watt)*
High Pressure Sodium	84-126
Metal Halide	67-93
Fluorescent	66-70
Mercury	44-57
Incandescent	17-24

\*Includes ballast losses.

There is overlapping of efficiencies between different lighting system and sometimes within a given lighting system for different wattage and life ratings.

Some general examples of the savings possible by relamping are given below. These kinds of savings are available to all borrowers and not just those considering the construction of new headquarters facilities.

Savings Possible by Relamping

## Application 1: Office Lighting (2,700 Hours Use Annually)

Existing Installation (Changed To) New Installation	Energy* (kWh)	Annual Savings	
		Dollars (\$) ** at 3¢/kWh	at 5¢/kWh
1 - 300 Watt Incandescent -- 1 - 100 Watt Mercury Vapor	486	14.58	24.30
2 - 100 Watt Incandescent -- 1 - 40 Watt Fluorescent	400	12.00	20.00
7 - 150 Watt Incandescent -- 1 - 150 Watt Sodium Vapor	2,360	70.80	118.00

## Application 2: Industrial Lighting (3,000 Hours Use Annually)

## Existing Installation (Changed To) New Installation

1 - 300 Watt Incandescent -- 2 - 40 Watt Fluorescent	623	18.69	31.15
1 - 1,000 Watt Incandescent -- 2 - 215 Watt Fluorescent	1,617	48.51	80.85
3 - 300 Watt Incandescent -- 1 - 250 Watt Sodium Vapor	1,806	54.18	90.30

\*Normal ballast losses are included.

\*\*These figures represent annual energy savings only. Installation and maintenance costs are not included.

3. Lighting Levels: The ability of a person to perform specific functions (tasks) is related to the level of illumination present in the working environment. The following table contains recommended illumination levels for new or modified commercial (headquarters) facilities. These recommendations apply to the illumination level on the "work station" (the place where the task is actually performed) as opposed to the level of the "work area" which surrounds the work station and generally requires less illumination. To optimize energy utilization, REA recommends that this type of "nonuniform" illumination approach be used.

Recommended Lighting Levels

Task or Area	Illumination Level (Footcandles*)
Hallways or Corridors	10 $\pm$ 5
Work and Circulation Areas Surrounding Work Station	30 $\pm$ 5
Normal Office Work (Task Only)	50 $\pm$ 10**

\*footcandle = 1 lumen per square foot

\*\*prolonged or visually difficult tasks may require illumination levels above this guideline. In such cases, the additional illumination should be concentrated on the task itself and not the work station.

4. Practical Considerations in Lighting System Selection: In evaluating the relative merits of the various lighting systems available, some items to be considered are:
- Is the system designed for the expected activity?
  - Are efficient light sources and fixture utilized?
  - Is flexibility provided for controlling the system and its components?
  - Is natural light used to maximum economic advantage?
  - Is lighting equipment easily cleaned and relamped?
  - Are the illuminating characteristics suitable for the tasks?

Lighting is one factor that should be considered in headquarters construction. However, it is not the only factor. Whatever lighting scheme is decided upon must be consistent with the overall energy conservation package for the specific facility under consideration.



- F. Load management can be useful, not only in customer load control, but also in load control of cooperative facilities. A load management plan for headquarters facilities should allow for either separate building load control or total system control. In new facilities, equipment should be installed which can be used with load control devices. In existing facilities, equipment should be retrofitted or systematically replaced by equipment capable of being used with load control devices. Examples of equipment controlled by load management are water heaters, central air conditioning, and heating systems.
- G. Infiltration of air through cracks, doors, and windows allows outside air to enter and mix with inside air. The resulting temperature change will require added energy to be used to control inside temperatures. Tight fitting door and window frames and insulated doors and windows should be installed in new buildings. Caulking around windows and in cracks, storm windows, and weather stripping can be used to alleviate some of these problems in existing buildings.
- H. Landscaping can have energy-saving effects. Evergreens planted along the windward side of a building act as a windbreaker and can be quite effective in reducing wind infiltration. Deciduous trees, planted on the south side of a building can provide shade from the summer sun. Buildings should not be constructed on hilltops or in open areas which allow wind infiltration.

#### IV. Specifications:

- A. REA Form 257, "Contract to Construct Buildings," should be made a part of the specifications. All applicable blank spaces should be completed. This includes completion of the liquidated damages clause in Article V (REA recommends a minimum of \$25.00 per day for contracts estimated to be under \$50,000; \$50.00 per day from \$50,000 to \$100,000 and an appropriate sum for contracts over \$100,000. These figures are only recommendations. The figure inserted should be consistent with actual potential damages which can be shown. The figure should be sufficiently high to be meaningful, but not so high as to be a penalty). Alternates, if any, should be clearly described in Article I and numbered in the same sequence when called for on the plans.
- B. References to A.I.A. forms and documents should not be incorporated in the specifications because of possible legal conflicts in interpreting REA and American Institute of Architects (A.I.A.) forms.
- C. For ease of reference, an "Index to the Specifications" should be furnished.
- D. An "as-built drawings" clause should be included in the mechanical, plumbing and electrical sections of the specifications.

- E. The public laws are often included in the specifications. REA does not object to this procedure; however, the ultimate responsibility for satisfying the applicable provisions of the law rests with the borrower and indirectly with its architect (not with the builder).
- F. If a project includes a pre-engineered metal building, then its roof live load and the structure's wind load should be specified.
- G. A 5-to-10-year guarantee (from the date of final acceptance of the project) against defects, faulty workmanship, etc., should be specified for built-up roofing.
- H. Proprietary-named products and material should not be specified. If they are so specified, an "or approved equal" clause must be included.

V. Public Laws:

- A. Public Law 90-480 (43 U.S.C. 4151) pertains to the design, construction and equipment of certain buildings that must be made accessible and usable by physically handicapped employees and/or public. The applicable provisions of the law always apply to the office portion (new or remodeled, single-story or multi-storied) of a headquarters facility; may apply to the service portion of a headquarters facility if offices are included for which handicapped persons may conceivably be employed; do not apply to unattended central office buildings, even though a small office may be furnished for use by technical or field personnel.

Appendix A of REA Bulletins 86-3, "Headquarters Facilities for Electric Borrowers," or 320-5, "Headquarters Facilities for Telephone Borrowers," states certain requirements for compliance with this law as modified by the General Services Administration and the Architectural/Transportation Barriers' Compliance Board. The following are some provisions which are most often omitted or not clearly presented in the plans and specifications.

1. Parking

- a. If the number of parking spaces for a facility is between 2 and 400, provide a minimum of 2 handicapped spaces or 2 percent of the total number - whichever is greater.
- b. If parking spaces exceed 400, provide 8 spaces plus 1 percent over 401.
- c. Handicapped spaces must be at least 8 feet wide. A 5-foot wide access aisle between such spaces is acceptable (the access aisle may be reduced to no less than 4 feet 6 inches wide if individual spaces are provided).



- d. Curb cuts at raised curbs must be at least 3 feet wide and be sloped not to exceed 1:12. Access aisles (if sloped) must not exceed 1:50 slope.
- e. Surfaces at required parking spaces, access aisles, walks to building entrances, etc., must be stable and firm (gravel surfacing, earth, etc., is not acceptable).

## 2. Entrance Ramp

A ramp from the parking level to the building's floor level must be provided and furnished as follows:

- a. The ramp must be at least 4 feet wide having a slope not to exceed 1:12 and be constructed of nonslip material.
- b. The ramp must have a level platform, 5 feet wide by 5 feet long at the building's entrance.
- c. A level platform, 4 feet wide by 6 feet long, must be provided every 30 feet (maximum) and at changes in direction.
- d. At least one continuous railing 32 inches high must be provided on one side. Where there is an appreciable drop to the grade from either side of the ramp, a guardrail with a 2-inch high curb must be provided on each side.

## 3. Toilet Rooms

Adequate toilet facilities must be provided and their requirements must be clearly indicated on the final drawings:

- a. A toilet stall 3 feet wide by 5 feet 6 inches long (minimum dimensions) with grab bars on each side and a 32-inch wide outswinging door, must be provided in at least one of each men's and women's toilets on each floor. In lieu of this, a single toilet room per floor designed to be used by one occupant at a time is acceptable, in which case its entrance door must be self-closing. Rooms of this type must be approximately 5 feet wide by 5 feet long with grab bars furnished on one side and behind the water closet.
- b. In the remodeling or additions of buildings in which offices are included, either the existing toilet(s) must be modified or a new toilet(s) furnished in the addition. In either case the requirements outlined in 3a, c, d, and e of this part still pertain.

- c. Toilet entrance doors must be at least 32 inches wide.
- d. The maximum heights of fixtures above the finished floor must be clearly indicated in the final drawings. Maximum allowable heights are as follows:
  - (1) rims of wall-hung urinals ... 15 inches to 17 inches high
  - (2) water closets ..... 17 inches to 19 inches high
  - (3) grab bars ..... 33 inches high
  - (4) lavatories ..... 34 inches high
  - (5) bottom of mirrors ..... 40 inches high
- e. Vanities with closed fronts must be designed with at least one open-knee space beneath a lavatory. Minimum knee-space dimensions are 2 feet 3 inches high by 2 feet 6 inches wide.

4. Interior Ramps

Interior ramps sloped not to exceed 1:12 must be provided in lieu of steps where a change in floor elevations occurs.

5. Elevators

An elevator must be provided in buildings or additions having more than one story and in which the floors are designed to be used by handicapped employees and/or the public. Certain buildings or additions are designed in which the function of the floors seemingly precludes the use of an elevator. In such cases, we suggest this provision be reviewed with REA during the preliminary stage, so that a clear understanding of the intended use of the floors can be established.

6. Corridor Width

Corridors must be at least 3 feet wide; however, most building codes demand greater widths to satisfy emergency egress requirements regardless of the minimum handicapped provision.

7. Telephones

Regarding wall-hung public telephones when furnished:

- a. At least one phone must be mounted so that persons in wheelchairs have access (conventional phone booths are unacceptable).
- b. The top of the operating mechanism must not exceed 4 feet above the finished floor.

#### 8. Drinking Fountains

- a. Parallel approached fountains must have a clear floor space of at least 2 feet 6 inches wide by 4 feet long. (The 2 feet 6 inches dimension to be measured from the wall when fountains are fully recessed or from the fountain's face when semi-recessed/free standing.)
- b. Forward approached cantilevered fountains are strongly recommended.

#### 9. Doors and Entrance Vestibules

- a. A minimum clearance of 18 inches must be provided from the latch side edge of a door to its adjacent wall (usually applicable at alcove entrances to rest rooms, office rooms, etc.).
- b. Double leaf doors must each be at least 32 inches wide.

Between any two doors in series (e.g., entrance vestibules) provide a minimum of 4 feet plus the width of any door swinging into the space (example: a 7-foot wide vestibule must be provided if a 3-foot wide exterior door swings into the vestibule).

#### 10. Reception Counters

To satisfy the spirit of the law, reception counters should be designed as follows:

- a. Part of the work top counter height should not exceed 36 inches above the finished floor.
- b. At least one open-knee space, 2 feet 6 inches wide, should be provided on the "work" side of the counter.

- B. Public Law 91-596 (29 U.S.C. 651), "Occupational Safety and Health Act of 1970," (OSHA) pertains to the design, construction and equipment of all buildings (new or remodeled) for the safety and health of the employees.

The OSHA standards furnish a comprehensive list of requirements. The following are some provisions which are most often omitted or not clearly presented in the plans and specifications:



1. Depending on the size of a service area (e.g., garage, warehouse, storage, etc.,) at least two exterior and remotely located pedestrian doors must be provided (overhead doors with personnel doors in them are not considered acceptable means of emergency egress).
2. An adequate number of drinking fountains and fire extinguishers must be provided.
3. The floors, walls, ceilings, etc., of all toilet rooms must be of a finish that can be easily cleaned. The following are recommended:
  - a. Floors .... ceramic tile, sheet vinyl or vinyl asbestos.
  - b. Walls ..... ceramic tile or liquid tile paint.
  - c. Ceilings .. ceramic acoustical tile or liquid tile paint.
4. Adequate exit lights or signs must be provided, especially at the intersection of corridors, at pedestrian doors in service areas, at stairwells and generally at areas where immediate access and egress to the building's exterior are not readily discernible.
5. Railings, at least 42 inches high, must be provided at platforms, storage decks, etc., which are 4 feet above adjacent floors or ground level.
6. Railings with a vertical height of 30 inches minimum to 34 inches maximum above stair treads must be provided as follows:
  - a. One handrail on one side of stairways less than 44 inches wide, having both sides enclosed.
  - b. One handrail on each side of stairways less than 44 inches wide, having both sides open.
  - c. One handrail on the open side of stairways less than 44 inches wide, having one side open.
  - d. One handrail at each enclosed side and one handrail at each open side of stairways 44 inches to 88 inches wide.
7. A toeboard, 4 inches high must be provided at areas such as storage decks and platforms of stairs leading up to them to prevent material from falling and injuring persons below.

8. Metal access ladders must be provided with the following:
  - a. The rungs must be at least 16 inches wide, spaced not more than 12 inches on center (o.c.), and have a minimum diameter of 3/4 inch (a minimum diameter of 1 inch is required for individual rungs imbedded in concrete or if access ladders are located in damp areas).
  - b. The clear distance of the rung's centerline to its adjacent wall must be at least 7 inches.
9. Water closet seats must be of the open-front type.
10. The nose of each stair tread must extend 1/2 inch to 1 inch beyond the lower riser.
11. A "Caution--Step Down" sign must be posted on doors where substantial differences in floor levels occur (e.g., doors having sill heights 3 inches or more).
12. Entrance doors (to toilets designed for single occupancy) must be provided with privacy locks.

VI. Telephone Central Office Buildings:

- A. Exterior walls and roof systems should be constructed of masonry, concrete, concrete planks, etc., to afford maximum protection against fire and vandalism. Standard specifications and details (REA Forms 772, rev. 7-66; 772a, rev. 3-73; and 772b, rev. 9-64) furnish minimum construction standards.
- B. The economy, aesthetics and durability of pre-engineered metal buildings are recognized and acceptable to REA. However, valuable equipment could be further protected against vandalism, fire, etc., by introducing supplementary construction within the metal buildings' components.

The following construction and/or their combination are suggested. However, construction should not be limited to these suggestions (e.g., other methods of comparable performance would be acceptable).

1. Provide masonry walls (concrete block 6 inches or 8 inches thick) throughout the inside perimeter of the exterior metal walls. In addition, a ceiling designed to rest on these walls (constructed of precast concrete units, concrete slab, etc.,) should be installed.
2. Provide wood or steel studs throughout the interior perimeter of the exterior metal walls. The "outside" and "inside" faces of the studs, respectively, should be installed with plywood (or fiberboard) and fire code "60" drywall. In addition, a suspended fire-rated acoustical tile or fire code "60" drywall ceiling should be installed.

- C. Building and equipment racks should be designed and constructed to resist stresses induced by earthquake forces in accordance with the requirements of the Uniform Building Code.
- D. In the construction of additions, a temporary dust-tight partition should be provided to protect telephone equipment.
- E. An electric generator within the building should be enclosed within firewalls. Access to the generator room should be from the exterior only.
- F. To minimize the danger of fire spreading into the telephone equipment area, interior wall(s) of the equipment room should be designed as a firewall(s) and its door(s) labeled class "B".
- G. The cable opening or openings should be firmly sealed with cementitious material after the cables are in place.
- H. The cable vault exterior walls should be waterproofed.
- I. Carpet in the equipment room is not to be used because it is difficult to clean and sheds textile particles which could harm valuable equipment and may cause static-induced failure of switching equipment. A resilient floor (sheet vinyl or asbestos tile) - easier to clean, fire-resistant and free from static electricity - is recommended.
- J. Exposed downspouts in the equipment room are discouraged because possible dampness might corrode valuable equipment. Downspouts should be fully insulated, installed within an exterior wall or enclosed in a furred space.
- K. Shoescrapers imbedded in the platforms of exterior doors should be provided if the surrounding area is unpaved.
- L. The door(s) between the frame and telephone equipment room (as well as the exterior doors) should be furnished with a threshold and be weatherstripped to help minimize dust and dirt from entering the equipment rooms.
- M. Depending on the area of the telephone equipment room, at least one carbon dioxide-type fire extinguisher should be provided (REA Telephone Operations Manual - Section 1381). Carbon dioxide type extinguishers should also be furnished in frame and generator rooms.
- N. Exterior wall louvers should be furnished with fire dampers.
- O. Gas-type automatic fire suppression systems should be considered for all equipment rooms.
- P. The electric power service entrance should be protected by an overvoltage arrester.



VII. Headquarters Facilities (Office, Garage, Warehouse, Storage, Etc.)

- A. The floor of a mezzanine storage area should be designed for a live load of 125 PSF to 300 PSF, depending on its intended use, and the load should be clearly posted.
- B. The vault light switch should be on the exterior of the vault and equipped with a pilot light.
- C. Wall receptacles in garage or tune-up areas designed for heavy and sustained maintenance work should be of the explosion-proof type.
- D. Wood or rubber bumper guards should be furnished at loading docks.
- E. The jambs of overhead doors should be provided with continuous steel angles or other methods of protecting them from damage.
- F. Doors to toilet and mechanical equipment rooms should be self-closing.
- G. The wall(s) between the office and service portions should be firewall(s) and the door(s) in them labeled class "B".
- H. For ease of cleaning and maintenance, the interior walls of service areas, if painted, should receive a 5-foot high wainscot of liquid tile paint.
- I. The garage slab should be depressed at least 6 inches relative to the floor slab of an adjacent office area.
- J. The garage slab should slope toward a floor drain(s) or toward an overhead door(s).
- K. Stairwells, record vaults and mechanical equipment rooms should be of fire-resistant construction and furnished with fire doors.
- L. A night depository and a drive-in collection window are recommended.

VIII. All Buildings:

- A. Every new footing adjacent to an existing one should be specifically investigated and properly designed to fit existing foundation and soil conditions.
- B. Horizontal metal reinforcing should be provided at every second bed joint, e.g., 16 inches o.c., throughout all concrete block walls.
- C. Interior concrete floor slabs should be reinforced with welded wire mesh and rest on a plastic vapor barrier on a bed of gravel or crushed stone over well tamped earth.

- D. Exterior soffits should be provided with screened vents to help minimize condensation in the areas above them.
- E. Toilet fixtures should be hung on interior walls to help minimize the danger of water freezing in pipes.
- F. A 1/2-inch premolded expansion joint filler should be provided where the concrete floor slab meets the foundation wall.
- G. A coat of 3/4-inch cement parging or other approved type of waterproofing (from top of footings to grade level) should be provided on the exterior face of foundation walls, especially if constructed with concrete blocks. Foundation walls should be waterproofed whether or not the building has a basement.
- H. Fire dampers with fusible links should be provided at areas where ducts penetrate firewalls.
- I. Unfinished interior concrete floor slabs should receive at least one coat of hardener.
- J. A continuous steel bond angle or 1-inch expansion joint cover should be provided where new exterior walls meet existing walls.
- K. Glazing materials and architectural products incorporating glazing materials, should comply with the "Safety Standard for Architectural Glazing Materials" (16 CFR 1201) issued by the Consumer Products Safety Commission on January 6, 1977.

IX. Drawings:

- A. The plot plan should be oriented the same as the detailed floor plan(s) for ease of cross-reference.
- B. Floor plans should identify room designations by name (not by number alone) for ease of identification relative to function, cross-reference, etc.
- C. Overall dimensions should be shown on the structural as well as the architectural floor plans (e.g., building line to building line).
- D. For large projects requiring more than one sheet in laying out floor plans, a heavy and bold "match line" should be used to indicate where the plan on one sheet continues on another sheet.
- E. If possible, the exterior elevation of buildings should be included in the preliminary submittal so that REA can more effectively determine a project's estimated cost.

- F. In extensive and complicated remodeling projects, an existing floor plan, in addition to the new floor plan, should be furnished (instead of combining them). This will facilitate REA review of the new and old work by clearly showing the scope and intent of the project.
- G. Regarding the handicapped, the site plan must clearly show the following:
  - 1. The required parking spaces with access aisles.
  - 2. The ramp with a slope not to exceed 1:12 when required.
  - 3. Curb cuts when required.
- H. The following should be furnished:
  - 1. A room finish schedule with finished ceiling heights.
  - 2. A door schedule.
  - 3. Door and window types.
- I. The "architectural" site plan should include the approximate location of any well and/or sewage disposal system or clearly note and refer this work to the utility plan or specifications.
- J. A north arrow should be furnished on the site plan. Also this arrow should be superimposed by a reference north arrow, when applicable, so that elevation drawings, walls, rooms, etc., in lieu of the more complicated northeast, southwest, etc.
- K. Depending on the type of project, the preliminary plans should state the following: "This project will comply with Public Law 90-480 (42 U.S.C. 4151)" and/or "This project will comply with Public Law 91-596 (29 U.S.C. 651)." This assures REA of the architect's awareness that the applicable provisions of the laws must be clearly incorporated in the final plans and specifications.
- L. Two sets of preliminary plans and two sets of final plans/specifications should be submitted to REA for review.

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*Jack Van Mark*  
**Acting**  
Administrator

Index:

ARCHITECTURAL SERVICES:

Plans and Specifications for Buildings  
BUILDINGS

Plans and Specifications  
CONSTRUCTION:

Buildings (see BUILDINGS)

